

CLAIMS

1. A structure for supporting an optical telescope, comprising:

- (a) a base assembly that is adapted to support a primary mirror, said primary mirror including a predetermined size and shape and an outer perimeter and a center aperture; and
- (b) an upright member attached at a first end thereof to said base assembly at at least two locations, a first of said at least two locations being disposed inside said aperture of said primary mirror and a second of said at least two locations being disposed beyond said outer perimeter, said upright member including a second end thereof that is distally disposed away from said first end, said second end adapted to support at least one component.

2. The structure for supporting an optical telescope of claim 1 wherein said at least one component includes a turret that is adapted to pivot intermediate a first position and a second position.

3. The structure for supporting an optical telescope of claim 2 including a secondary mirror attached to said turret, said secondary mirror adapted to receive light energy reflected off of said primary mirror and redirect at least a portion of said light energy to said aperture of said primary mirror when said turret is disposed in said first position, and wherein when said turret is disposed in said first position, a center of said secondary mirror is disposed in alignment with a longitudinal axis passing through said aperture in said primary mirror.

4. The structure for supporting an optical telescope of claim 3 wherein when said turret is in said first position said primary mirror and said secondary mirror are adapted to transmit at least a portion of said light energy along a first primary optical path that impinges on said aperture of said primary mirror.

5. The structure for supporting an optical telescope of claim 4 including a beam splitter disposed proximate said aperture of said primary mirror.

6. The structure for supporting an optical telescope of claim 5 wherein said beam splitter includes a dichroic beam splitter.
7. The structure for supporting an optical telescope of claim 5 wherein said beam splitter is adapted to redirect a portion of said light energy along a first secondary path and a remaining portion along a second secondary path.
8. The structure for supporting an optical telescope of claim 7 wherein said first secondary path includes longer wavelengths of light than said second secondary path.
9. The structure for supporting an optical telescope of claim 8 wherein said first secondary path includes light energy in the infrared spectrum.
10. The structure for supporting an optical telescope of claim 9 wherein said first secondary path passes through

said beam splitter and through said aperture in said primary mirror.

11. The structure for supporting an optical telescope of claim 10 including a second turret that is disposed along said first secondary path, said second turret including at least one optical component that is adapted to be introduced into said first secondary path.

12. The structure for supporting an optical telescope of claim 11 wherein when said at least one optical component is introduced into said first secondary path, said at least one optical component is disposed below a surface of said primary mirror.

13. The structure for supporting an optical telescope of claim 11 wherein said second turret is adapted to rotate about an axis and wherein said second turret is adapted to introduce a plurality of optical components into said first secondary path.

14. The structure for supporting an optical telescope of claim 11 including a drive shaft that is mechanically connected to said second turret and wherein said drive shaft is adapted to be rotated intermediate at least two positions and wherein said at least one optical component is adapted to be disposed into said first secondary path in one of said at least two positions and wherein said at least one optical component is adapted to be removed from said first secondary path in another of said at least two positions.

15. The structure for supporting an optical telescope of claim 14 wherein said drive shaft is disposed in an opening provided in said upright member wherein a first end of said drive shaft is operatively attached to said second turret and wherein an opposite second end of said drive shaft is disposed beyond said perimeter of said primary mirror.

16. The structure for supporting an optical telescope of claim 15 including an electrical motor attached to said structure for supporting an optical telescope, said electrical motor adapted to rotate said drive shaft sufficient to urge said second turret intermediate said at least two positions.

17. The structure for supporting an optical telescope of claim 7 wherein said beam splitter is adapted to redirect said second secondary path back toward a second center aperture of said secondary mirror.

18. The structure for supporting an optical telescope of claim 17 wherein said second secondary path includes light energy having a shorter wavelength than light energy in said first secondary path, and wherein said shorter wavelength includes energy in the visible or near infrared spectrum.

19. The structure for supporting an optical telescope of claim 18 wherein said second secondary path passes through said second aperture in said secondary mirror and into said turret.

20. The structure for supporting an optical telescope of claim 19 wherein said turret includes a plurality of optical elements sufficient to redirect said second secondary path through a longitudinal length of said turret and down in a

direction that is substantially parallel with a said longitudinal axis of said primary mirror.

21. The structure for supporting an optical telescope of claim 20 wherein said upright member includes a linear side that extends from said first end to said second end thereof.

22. The structure for supporting an optical telescope of claim 21 including a tubular structure disposed adjacent to said linear side of said upright member, said tubular structure adapted to contain at least one optical element therein and wherein said second secondary optical path enters into said tubular structure.

23. The structure for supporting an optical telescope of claim 22 wherein said at least one optical element in said tubular structure includes a plurality of optical elements that are configured sufficient to provide zoom capability.

24. The structure for supporting an optical telescope of claim 22 wherein said at least one optical element in said tubular structure includes a camera.

25. The structure for supporting an optical telescope of claim 22 wherein when said turret is disposed in said second position, said secondary mirror is disposed beyond said aperture in said primary mirror and wherein when said secondary mirror is disposed beyond said aperture in said primary mirror said secondary mirror does not obstruct an active field of view along a second primary path that impinges on said aperture in said primary mirror.

26. The structure for supporting an optical telescope of claim 22 including a beam splitter disposed proximate said aperture of said primary mirror and wherein said beam splitter allows infrared energy to pass through said beam splitter and wherein said second primary path includes a shorter focal length than said first primary path and wherein said second primary path includes said infrared energy that passes through said beam splitter.

27. The structure for supporting an optical telescope of claim 25 wherein said upright member includes a linear side that extends from said first end to said second end thereof and including a tubular structure disposed adjacent to said linear side of said upright member, said tubular structure adapted to contain at least one optical element therein and wherein said second primary optical path includes a parallel second primary optical path that enters into said tubular structure when said turret is disposed in said second position.

28. The structure for supporting an optical telescope of claim 1 including an IMU that is attached to said base assembly.

29. The structure for supporting an optical telescope of claim 28 wherein said IMU includes a fiber optic gyroscope.

30. The structure for supporting an optical telescope of claim 28 wherein said IMU is attached to a member of said base assembly and wherein said primary mirror is attached to an opposite side of said member.

31. The structure for supporting an optical telescope of claim 1 wherein said upright member is attached to said base assembly at three locations.

32. The structure for supporting an optical telescope of claim 31 wherein two of said three locations are disposed in a spaced apart orientation with respect to each other at said second of said at least two locations.

33. The structure for supporting an optical telescope of claim 31 wherein said upright member includes a tripod that is attached at said three locations to said base assembly.

34. An improvement to an optical telescope that includes a base assembly and an upright member which is adapted to support at least one optical component in an optical path above a lower optical element, wherein the improvement comprises:

(a) attaching said upright member to said base assembly at a first location that is disposed inside an aperture of said lower optical element; and

(b) attaching said upright member to said base assembly at a second location that is disposed outside an outer perimeter of said lower optical element.

35. The improvement of claim 34 including attaching said upright member to said base assembly at a third location that is disposed outside of said outer perimeter of said lower optical element and wherein said third location is disposed away from said second location.

36. The improvement of claim 34 wherein said aperture is disposed in concentric alignment with respect to a geometrical center of said lower optical element.

37. The improvement of claim 34 wherein said upright member includes means for moving said at least one optical component from a first position in said optical path to a second position that is not in said optical path.

38. The improvement of claim 37 wherein when said at least one optical component is in said second position, at least one of said at least one optical component is urged to a position that is disposed beyond an active viewing area of said lower optical element.

39. An improvement to an optical telescope that includes a base member and a primary mirror that is attached to said base assembly, wherein the improvement comprises:

attaching an IMU to said base member proximate said primary mirror.

40. The improvement of claim 39 wherein said IMU includes at least one fiber optic gyroscope.

41. The improvement of claim 39 wherein said primary mirror is attached to a first side of said base member and said IMU is attached to an opposite second side of said base member.

42. An improvement to an optical telescope that includes a first optical path and a second optical path, said first optical path including a first wavelength of light energy and said second optical path including a second wavelength of light and wherein said second wavelength is different than said first wavelength, and wherein at least one optical group is adapted to be inserted into either said first optical path or into said second optical path and removed therefrom, wherein the improvement comprises:

maintaining said first wavelength of light energy in said first optical path and maintaining said second wavelength of light in said second optical path when said at least one optical group is inserted into either said first optical path or into said second optical path and maintaining said first wavelength of light energy in said first optical path and maintaining said second wavelength of light in said second optical path when said at least one optical group is removed from either said first optical path or from said second optical path.

43. The improvement of claim 42 wherein said first wavelength includes infrared and said second wavelength includes visible.

44. The improvement of claim 42 wherein said first wavelength includes infrared and said second wavelength includes near infrared.